

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

- 1 1. (Original) An imaging system configured to compensate for one or more
2 individual defective pixels in an array of pixel elements, the system
3 comprising:
4 an array of pixel sensor elements;
5 a readout controller coupled to the array, the readout controller
6 configured to read a block of pixels within the array, the block
7 including a center pixel, the controller further configured to generate
8 pixel addresses of at least three subsets of pixels within the block;
9 and
10 a bad pixel detection and correction unit configured to determine a
11 subset with a minimum variance, calculate a median of each
12 subset, determine whether a value of the center pixel exceeds the
13 medians of the subsets, and to replace the value of the center pixel
14 with the median of the subset with the minimum variance if the
15 value of the center pixel exceeds the medians of the subsets.
- 1 2. (Original) The imaging system as defined in Claim 1, wherein the array
2 comprises a monochrome array.

1 3. (Original) The imaging system as defined in Claim 1, wherein the system
2 further comprises a color filter deposited on the array.

1 4. (Original) The imaging system as defined in Claim 1, wherein the subsets
2 comprise a horizontal row and two diagonal patterns.

1 5. (Original) The imaging system as defined in Claim 1, wherein the subsets
2 comprise a vertical row and two diagonal patterns.

1 6. (Original) A method of correcting one or more individual defective pixels in
2 an array of pixel elements, the method comprising:

3 reading a pixel block of an array of pixel sensor elements, the pixel
4 block including an interior pixel;

5 selecting at least a first subset, a second subset and a third subset of
6 pixels within the pixel block, the first subset comprising pixels
7 arranged in a first diagonal pattern within the block, the second
8 subset arranged in a second diagonal pattern within the block, the
9 third subset arranged in a non-diagonal pattern;

10 calculating a variance between a highest and a lowest pixel sensor
11 value within each subset;

12 identifying a subset with the least variance;

13 calculating a first value based on at least one of a median, average,
14 and mean pixel sensor value for the corresponding three subsets;

15 determining whether a value for the interior pixel varies from the first
16 value by more than a first amount; and

17 replacing the value for the interior pixel with a replacement value
18 based on the pixel sensor values of the subset with the lowest
19 variance if the value for the interior pixel varies from the first value
20 by more than a first amount.

1 7. (Original) The method of Claim 6, further comprising:
2 selecting a fourth subset arranged in another non-diagonal pattern;
3 and
4 calculating a variance between a highest and a lowest pixel sensor
5 value within the fourth subset.

1 8. (Original) The method of Claim 6, wherein the non-diagonal pattern is
2 horizontal.

1 9. (Original) The method of Claim 6, wherein the non-diagonal pattern is
2 vertical.

1 10. (Original) The method of Claim 6, wherein the act of reading a pixel block
2 comprises reading a 3 x 3 pixel block.

1 11. (Original) The method of Claim 6, wherein the act of reading a pixel block
2 comprises reading a 5 x 5 pixel block.

1 12. (Previously Presented) A method of detecting and compensating a
2 defective pixel element within an array of pixel elements in an imaging
3 device while the imaging device is in use by an end-user, the method
4 comprising:

5 capturing an image taken by the end-user using the imaging device;
6 for the captured image,

7 selecting a first pixel element for determination that said pixel
8 element is defective,
9 identifying an associated set of pixel elements of said array of pixel
10 elements in which said first pixel element is member,
11 partitioning said associated set of pixel elements of said array into a
12 plurality of subsets of the associated set such that said first pixel
13 element is centrally included,
14 determining an arithmetic central value for each of the plurality of
15 subsets of the associated set;
16 comparing a value of said first pixel element with a second value
17 related to said arithmetic central value for each of the plurality of
18 subsets of the associated set;
19 determining from the comparison if the value of the first pixel element
20 is in error; and
21 substituting a third value related to the value of at least one of the other
22 pixels elements at least partly in response to determining the value
23 of the first pixel element is in error.

1 13. (Previously Presented) The method as defined in Claim 12, wherein the
2 comparison act includes comparing the value of the first pixel element with
3 the median value of each of the plurality of subsets of the associated set.

1 14. (Previously Presented) The method as defined in Claim 12, wherein the
2 plurality of subsets of the associated set include at least two pixel
3 elements adjacent to the first pixel element.

1 15. (Previously Presented) The method as defined in Claim 12, wherein the
2 second value is also related to the value of the first pixel element.

1 16. (Previously Presented) The method as defined in Claim 12, wherein the
2 third value is related to the median value of at least two other pixel values.

1 17. (Previously Presented) The method as defined in Claim 12, wherein the
2 imaging device is a color imaging device, and the pixel elements of the
3 plurality of subsets of the associated set whose values are compared to
4 the first pixel value are intended to sense the same color as the first pixel
5 element.

1 18. (Original) The method as defined in Claim 12, wherein the imaging device
2 is a monochrome imaging device.

1 19. (Previously Presented) An imaging system configured to compensate for
2 one or more individual defective pixels in an imaging array, the system
3 comprising:

4 a readout controller coupled to the imaging array, the readout

5 controller configured to read a group of pixels within the array;

6 a defective pixel detection circuit configured:

7 to select a first pixel element for determination that said pixel

8 element is defective,

9 to identify an associated set of pixel elements of said array of pixel

10 elements in which said first pixel element is member,

11 to partition said associated set of pixel elements of said array into a
12 plurality of subsets of the associated set such that said first pixel
13 element is centrally included,
14 to determine an arithmetic central value for each of the plurality of
15 subsets of the associated set,
16 to compare a value of said first pixel element with a second value
17 related to said arithmetic central value for each of the plurality of
18 subsets of the associated set at least element values of other
19 imaging pixel elements in a first group, and
20 to determine from the comparison if the value of the first pixel
21 element is in error; and
22 a pixel compensation circuit configured to replace the value of the first
23 pixel with a third value related to at least one other pixel within the
24 group of pixels when the first pixel value varies by more than the
25 first amount from the second value.

1 20. (Previously Presented) The imaging system as defined in Claim 19,
2 wherein the second value is a median value of each of the plurality of
3 subsets of the associated set.

1 21. (Previously Presented) The imaging system as defined in Claim 19,
2 wherein the second value is an average value of each of the plurality of
3 subsets of the associated set.

- 1 22. (Previously Presented) The imaging system as defined in Claim 19,
2 wherein the third value is related to the median value of each of the
3 plurality of subsets of the associated set.
- 1 23. (Original) The imaging system as defined in Claim 19, further comprising a
2 color filter overlaying at least a portion of the array.
- 1 24. (Original) The imaging system as defined in Claim 19, wherein the array is
2 a CMOS array.
- 1 25. (Original) The imaging system as defined in Claim 19, wherein the array is
2 a CCD array.
- 1 26. (Previously Presented) A camera system, comprising:
2 an imager, including a plurality of pixels;
3 a lens overlaying at least a portion of the imager;
4 a readout circuit coupled to the imager, the readout circuit configured
5 to read imager pixel values;
6 a defective pixel detection circuit configured:
7 to select a first pixel element for determination that said pixel
8 element is defective,
9 to identify an associated set of pixel elements of said array of pixel
10 elements in which said first pixel element is member,
11 to partition said associated set of pixel elements of said array into a
12 plurality of subsets of the associated set such that said first pixel
13 element is centrally included,

14 to determine an arithmetic central value for each of the plurality of
15 subsets of the associated set,
16 to compare a value of said first pixel element with a second value
17 related to said arithmetic central value for each of the plurality of
18 subsets of the associated set at least element values of other
19 imaging pixel elements in a first group, and
20 to determine from the comparison if the value of the first pixel
21 element is in error; and
22 a pixel compensation circuit configured to substitute the value of the
23 first pixel with a value related to at least one other pixel value
24 readout by the readout circuit; and
25 a power supply used to power the readout controller, the defective
26 pixel detection circuit, and the pixel compensation circuit.

1 27. (Original) The camera system as defined in Claim 26, wherein the camera
2 system is a video camera.

1 28. (Original) The camera system as defined in Claim 26, further comprising
2 an NTSC encoder coupled to the readout circuit.

1 29. (Original) The camera system as defined in Claim 26, wherein the camera
2 system is located on a phone.

1 30. (Original) The camera system as defined in Claim 26, further comprising a
2 color filter positioned over at least a portion of the imager.

1 31. (Currently Amended) A method of detecting a defective pixel element
2 within ~~an array of~~ pixel elements in an imaging device using an image
3 captured by the end-user, the method comprising:

4 selecting a first pixel element of said image for determination that said

5 pixel element is defective;

6 identifying a two dimensional neighborhood associated with said first

7 pixel element;

8 partitioning said two dimensional neighborhood into a plurality of

9 subsets of the associated set such that said first pixel element is

10 centrally included;

11 determining an arithmetic central value for each of the plurality of

12 subsets of said two dimensional neighborhood;

13 for the captured image, comparing a value of ~~a~~ said first pixel element

14 with a second value related to ~~an~~ said arithmetic central value

15 determined from element values of pixel elements in ~~a~~ said two

16 dimensional neighborhood associated with said first pixel element;

17 determining from the comparison if the first pixel element value is in

18 error; and

19 substituting the first pixel element value with a third value related to a

20 value of at least one of the other pixels elements in the two

21 dimensional neighborhood.

1 32. (Original) The method as defined in Claim 31, wherein the second value is
2 related to at least two element values corresponding to at least two pixels
3 on opposite sides of the first pixel element.

1 33. (Original) The method as defined in Claim 31, wherein the comparison
2 includes determining if the first pixel element value varies from the second
3 value by more than a threshold amount.

1 34. (Currently Amended) An imaging system comprising:
2 an imager including a plurality of pixel sensor elements;
3 a controller coupled to the imager, the controller configured to read
4 pixel sensor element values;
5 a defective pixel detection circuit in communication with the controller
6 and configured to identify a first pixel, identify a two dimensional
7 neighborhood associated with said first pixel, to partition said two
8 dimensional neighborhood, to determine an arithmetic central value
9 for each of the plurality of subsets of said two dimensional
10 neighborhood, and to determine when a value of a first pixel
11 associated with a first pixel sensor element within a two
12 dimensional neighborhood associated with said first pixel is in error
13 by comparing the value of the first pixel to a second value related to
14 an arithmetic central value determined from at least one other pixel
15 element within the two dimensional neighborhood; and

16 a pixel compensation circuit configured to replace the value of the first
17 pixel element with a third value related to at least one other pixel
18 element within the two dimensional neighborhood.

1 35. (Previously Presented) The method as defined in Claim 12, wherein the
2 arithmetic central value for each of the plurality of subsets of the
3 associated set is the median, average, or mean of for each of the plurality
4 of subsets of the associated set.

1 36. (Previously Presented) The imaging system as defined in Claim 19,
2 wherein the arithmetic central value for each of the plurality of subsets of
3 the associated set is the median, average, or mean of for each of the
4 plurality of subsets of the associated set.

1 37. (Added) The camera system as defined in Claim 26, wherein the
2 arithmetic central value for each of the plurality of subsets of the
3 associated set is the median, average, or mean of for each of the plurality
4 of subsets of the associated set.

1 38. (Currently Amended) The method as defined in Claim 31, wherein the
2 arithmetic central value for each of the element values of pixel elements in
3 a two dimensional neighborhood associated with said first pixel element
4 ~~the plurality of subsets of the associated set~~ is the median, average, or
5 mean of for each of the plurality of subsets of the associated set.

1 39. (Currently Amended) The imaging system as defined in Claim 34, wherein
2 the arithmetic central value for each of the at least one other pixel element
3 within the two dimensional neighborhood ~~of the plurality of subsets of the~~

4 ~~associated set~~ is the median, average, or mean of for each of the plurality
5 of subsets of the associated set.